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ABSTRACT

The key to successful harnessing of the power and potential of new educational technologies lies in appropriate training of teachers. An educational technology joint venture was created at the Northern Territory University in Darwin (Australia) in which the Institute of Technical and Further Education provided the equipment, the Computing Services section provided the technical support, and the Faculty of Education trained the trainers. This joint venture has provided a vertical integration of expertise in preservice and inservice training for teachers and lecturers. It helps trainers acquire a "mindshift in attitudes" to use information technology to facilitate an exciting and lasting journey of discovery for their students. Students and lecturers are given a "tool set" of skills and techniques, beginning with word processing and idea processing, followed by up to three core units in information technology. Effective use of new technologies is enhanced by use of interactive tutorial packages that allow users to perform real exercises involving all of the major sections in the application. For the future, the university is looking at Electronic Performance Support Systems which integrate hardware, software, and end-user interfaces and provide on-the-job assistance and training. (JDD)

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Training the Trainers in Technology

ED 375 092

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Abstract

The key to the successful harnessing of the power and potential of the new technologies lies in the appropriate training of the trainers, the teachers and the lecturers. The Faculty of Education does not have any training facilities of its own. In a successful working partnership, the Institute of Technical and Further Education provides the equipment, Computing Services the technical support and we train the trainers.

This innovative joint venture has provided a vertical integration of expertise in preservice and inservice training for teachers and lecturers. The access to the latest technologies and resources has enabled the development and presentation of very effective and stimulating teaching and learning materials.

Keywords

tertiary education, inservice teacher education, educational uses of computers, training in technology, multimedia.

Background

At the International Conference on Technology and Education in Paris in 1992, Seymour Papert suggested that it was time for perestroika in computer education. If this simply referred to the provision of hardware, this has certainly happened in the Northern Territory. Prideaux (1989) alluded to the 1980's as the period of 'acquisition' and the 1990's as the period of 'adoption'. But as Glenn Russell (1992:158) pointed out, "the provision of hardware and software is a necessary but not sufficient condition for the *effective* use of computers."

Ten years ago there were no computers in any government schools in the N.T. In the late 1980's the decision was made that there would be computers in all schools and within a year there were, even in some schools that did not have power!! The key to the successful harnessing of the power and potential of the new technologies lies in the appropriate training of the teachers. This will require a mindshift in attitudes as well as the provision of a "toolset" of skills and techniques on behalf of the trainers.

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Barely five years ago none of the lecturers in the Faculty of Education used a computer. None of them had used a computer when they were classroom teachers. The Faculty had no units of its own in educational computing: it now has a range of educational computing courses at the undergraduate and post graduate level. Now everyone has either a Macintosh or an IBM connected to a central server, a laser printer and the world via AARNET. A wide range of tools are used for text processing and transmission, materials preparation, statistics and reporting.

Because the Faculty of Education does not have any training facilities of its own, the Institute of Technical and Further Education provides the equipment, Computing Services the technical support and we train the trainers. This innovative joint venture has provided a vertical integration of expertise in preservice and inservice training for teachers and lecturers. The access to the latest technologies and resources has enabled the development and presentation of very effective and stimulating teaching and learning materials.

The animated interactive presentations you will see in my presentation were produced by our students and lecturers using those facilities and resources. They show how this has proved to be a very successful working partnership.

Introduction

Has the impact of computers been as great as predicted? Of course it was only just over a decade ago that the President of IBM said that he could not see any future for the personal computer in education. In the mid 1980's in Australia we talked of "Golden Opportunities" and of being on the "Crest of a Wave" in educational computing. I remember in 1986 being so excited by the first Laser Disc I saw used with a B.B.C. computer. Yet how many primary schools have a Laser Disc player today?

There are some "lighthouse" or "beacon" schools but they are very few and far between. Perhaps it is time to look at just where have we come and ask ourselves the question "Quo Vadis Magister?" What are our directions for the next decade? Here in lies the theme for this paper, **Yesterday's Dreams - Today's Realities.** Will we see a complete revolution in educational practice and training? Or will it rather be a selective "culling" of some of the outmoded and less successful methods and approaches? Computers like any other form of Information Technology can be used to maintain the status quo by reinforcing and entrenching outmoded practices.

The Past

Ten years ago there were no computers in any government schools in the N.T. There are now over 35000 computers for our 1700 students. The N.T. like England in the early 1980's had so many computers in the schools but not enough teachers with the expertise or "tool set" to be able to use them effectively. To address this situation a unique jointly funded and staffed Computer Education Centre was established by the N.T. Department of Education and located on the campus of what is now the N.T. University. This unit was to provide a vertical level of expertise for preservice and inservice teachers in terms of courses, resources, advice and advisory visits, research and development of new materials.

Our first courses in educational computing for preservice teachers in the Faculty of Education were set up in the mid 1980's by the Faculty of Mathematics and Applied Science. At that stage none of the lecturers in the Faculty of Education had ever used computers when they were teaching, there was no computer component in any methods courses and only 2 of the 25 lecturers used computers, an Apple 2E and an Apple 2C. There was a compulsory Computer Awareness unit, an elective unit, Computers and Society, and a unit, Computing Methods, taken by Grad Dip Ed students: none of the lecturers involved had any background in Educational or Classroom computing.

Those units have been changed, altered, modified and even deleted. As well other units have been written and we now offer a 3 unit specialisation in the Dip T or B Ed, up to six units out of ten for the B Ed, a Graduate Certificate and Diploma, an M Ed Studies and an M Ed.

This paper shows how we have progressed from what were "**Yesterday's Dreams**" to what are "**Today's Realities**" this was a process of evolution rather than revolution or perestreelka rather than perestroika.

The Present

Just because the computers were in the schools did not mean that they were being used to enhance the teaching and learning environment. Computers like any other form of Information.Technology. can be used to maintain the status quo i.e. to reinforce and entrench outmoded classroom practices. They should of course be used to facilitate the development "of a new and exciting learning environment where active learning and investigation problem solving replace a content driven curriculum."

We can no longer talk of education in terms of and end product i.e. students who can jump over some arbitarilly imposed academic hurdle, but rather in terms of education being a lifelong process, a journey of discovery, a preparation for a world that is constantly changing and that demands higher order thinking skills such as communication and collaboration.

We have to ask ourselves how we can harness the power of Information Technology not merely to update old models of schooling (Drill and Practice for computerised memorization of facts) but to assist us as educators to prepare our students for the future.

It is not only a matter of providing trainers with a "toolset": there must first of all be a mind shift. Many teachers are like I was only a few years ago. I was a cross between a Luddite, King Canute and an ostrich. As Head of the English Faculty in the largest High School in the Northern Territory I couldn't see why I, or my teachers, would want to use this latest educational "gimmick". Those of us who are old enough can remember the 16mm projector, the reel to reel tape recorder, the Dukane Machine, the S.R.A. Reading Laboratories. All of us are now familiar with the V.T.R., the photocopier, the fax .....

For the past 5 years I have been ***the*** lecturer in Classroom uses of Computers and related technologies. How did this come to pass? How then can our trainers undergo such a change in mindset and how can they acquire their own, albeit limited at first,"tool set" so that they are prepared and able to use Information Technology to facilitate an exciting and lasting journey of discovery for their students?

I have included in the trainers, both our student teachers and the teachers and lecturers. All of them need to be able to use the new I.T tools because in this decade more and more learners will have access to them and as trainers we have to be able to facilitate this process. You will only need to watch some of my presentation materials to see how text, sound and image can be combined to produce a new form of reference book which enables students to be a active learners rather than a passive recipients of knowledge.

Such tools have enabled a shift from the coverage of content in the curriculum to using the content to help students think and learn about the world. Dave Allan of the Marigold School in British Columbia spoke of a "new renaissance that is driven by new technologies" (1991:11). Students need to be empowered so that they can access and use appropriate forms of Information Technology (I.T.). They need to be able to cooperate rather than compete.

I.T. tools can encourage active participation, selfpacing and choice of learning style. Students have the opportunity to explore ideas, experiment, create and take risks. We have to provide toolkits to enable students to create and access information bases. It is possible to have the same sort of tools but at different levels of sophistication e.g. MacWrite or Word 5.1, Quark Express or Pagemaker, Works or File Maker Pro and Power Point or Macro Mind Director.

We are fast approaching the situation in the elementary schools at least where the saying "Every teacher is a teacher of English because every teacher is a teacher in English", can now be rephrased as 'Every teacher is a teacher of Information Technology because every teacher is a teacher in Information Technology."

The Approach

You have all heard about the 3 R's, well what about the 3 C's?

Confidence Competence Creativity

These are the three stages we have found that learners pass through when they are using Information Technology. Because it is so true that "nothing succeeds like success" we ensure right from the start that users do have success by tailoring the activities to the individual. This doesn't mean that it has to be easy: I have coined the term "hard fun" because we expect them to work "smarter not harder".

The following aphorism underlies the approach we use in all our units:

I hear and I forget

I see and I remember

I do and I understand

Because of the nature and location of our campus some 25% of the intake into the first year of our teacher training program have a mother tongue which is a language other than English (L.O.T.E.) and for whom English is a second or even third language. These students have had in the past difficulty in coping with the demands of academic writing at the tertiary level. Tutorial and Elective courses have been tried but with limited success. As well may of them have not had the background in the use of computers and related technologies that most of our students have had. Their attitudes towards the use of computers, and related technologies, and their perceptions of their educational value are not what they should be.

We start with a compulsory unit in Semester 1 where they are given a tool set to enable them to cope with the demands of academic writing. This is particularly necessary for our 25% students whose mother tongue is a language other than English (L.O.T.E.) and for whom English is a second or even third language. By the end of the first tutorial they have created, edited, formatted and printed out on a Laser Printer a piece of text.

They are then introduced to a range of idea processing tools to enhance their work by helping them in planning, composition, referencing and presentation. By the end of the second tutorial they are expected to be able to submit all their assignments wordprocessed. This approach has been very successful because of the facilities we have and the peer tutoring system, where students who already have sufficient skills, are encouraged to be peer tutors.

In a very short period the students have acquired not only a useful personal toolkit, but a very positive attitude towards the use of this particular I.T. tool and an appropriate "mindset" as well. When they leave us if they have taken at least the 3 core units available they will not only have the mindset and the toolkit to use I.T. effectively themselves but also to harness its power to take advantage of the vast range of educational activities to enhance the whole range of classroom activities, curriculum, content and methodology.

As well we have had to address the needs of the lecturers. Remember only 5 years before none of them had used computers or included any computer related activities in their units. Suddenly they all had a Macintosh SE or IBM and students who expected computer related activities in their units. We provided the same range of experiences and resources as their students had. Now all use a range of I.T. tools for text processing and transmission, materials preparation, statistics and reporting. As well lecturers from other faculties have taken units offered at all levels.

The future

Today there is a wide range of computer related technologies that can be used to enhance the delivery of instructional materials. Trainers to be able to do this must implement new teaching and instructional strategies and methods. The key to the successful harnessing of the power and potential lies in the appropriate training of these trainers. This will require a mindshift in attitudes as well as the acquisition of a "toolset" of skills and techniques.

Tomorrow's technology is available today, but why is it not being used to enhance the teaching and learning environment in classrooms? It is partly a cost factor, but it is more a problem related to the implementation and effective training of the instructors involved. No institution or corporation can afford to waste time, money or effort, but as the new applications and equipment have become more powerful the potential users have more material, concepts and skills to acquire

before they can successful harness this power. The existing linear, uniformly paced, instructor controlled, one medium style delivery of instructional materials is no longer satisfactory.

The solution lies in using the new technologies themselves. Interactive tutorial packages utilising the capabilities of CD Rom technology enable users to learn how to use applications and equipment without actually accessing them. In much the same way as pilots are trained on flight simulators, these interactive tutorials allow the user to perform real exercises involving all of the major sections involved in the application. At the end of each exercise the user is tested and results recorded. If progress has not been satisfactory then the user returns to that section before moving on. The ability of such systems to give fast and measurable results is vital in ensuring that the learning process is as effective and efficient as possible. But the major reason for the success of this approach is because it satisfies all of the factors considered necessary for effective learning to take place.

The instructional programs to be demonstrated were produced by our Trainee Trainers, using Hypercard and Authorware Professional and Presentation Magic, which are authoring packages which create animated interactive presentations without scripting. They clearly show the potential in this area.

The future in Computer Mediated Instruction lies in two directions. The first is the development of Electronic Performance Support Systems which will integrate hardware, software and end-user interfaces. This represents a shift from Computer Based Training which essentially relates to training before you use the equipment "on the job". In this approach assistance and training are provided while you are "on the job". It encompasses an enhanced interactive support environment, which provides guidance, advice, help and instruction, with minimum support and help from others.

This concept of "just in time training" (JIT) is derived from the the JIT inventory control methods adopted by the Japanese. The N.T. University has been looking at these EPSS techniques for some time. Negotiations are in hand to establish an Authorware Professional Training Centre within the School of Information Technology and the Computing Services Section is investigating the establishment of a Computer Mediated Training Centre, which would take cognizance of both concepts and explore the use of on-line help systems, full text retrieval packages, interactive multi media courseware, using the latest Digital Video Interactive technology rather than the existing videodisc technology which is based on anolog data.

If you would like copies of any of the materials you have seen please contact me as we would be very pleased to share them with others.

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